PROCEEDINGS OF THE
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ORDINARY MEETING

WEDNESDAY, 5th MARCH, 1958, at 5.30 p.m.

AGENDA

1. Confirmation of the Proceedings of the Ordinary Meeting held on 15th January, and of the Annual Meeting held on 5th February, 1958.

2. Announcement of Vice-Presidents for 1958.

3. Recommendations of candidates for Fellowship. First reading.

4. Recommendations of candidates for Fellowship. Second reading.

5. Announcement of election of new Fellows.

6. Additions to the Library [see p. 4].

7. Admission of Fellows.

8. Exhibits.

Fellows are particularly requested to bring suitable exhibits to the Meeting even though it may not be possible to announce their intention to do so beforehand.

> *Note.*—To avoid congestion in the Library and to enable exhibits to be displayed to greater advantage, a table has been placed in the meeting-room for this purpose. Fellows are asked to place their exhibits on this table, with a suitable explanatory note, as soon as possible on the afternoon of the meeting, so that they are available for inspection there before the meeting opens.

9. Communications.

Dr. C. A. Clarke and **Dr. P. M. Sheppard.**

Genetics and race-crosses in *Papilio dardanus* Brown.

[ABSTRACT].

In a previous talk (1956, *Proc. R. ent. Soc. Lond.* (C) **21** : 40–41) some preliminary data were given on the genetics of the various female forms of *Papilio dardanus* Brown, ssp. *cenea* from South Africa (not to be confused with f. *cenea* which is the most common form in this subspecies). On continuing the investigation it has been possible to elucidate the genetics of all the South African forms.

Thus it appears that :—

(1) f. *hippocoonides* is recessive to all the other forms.

(2) f. *cenea* is recessive to f. *trophonius* and usually to f. *leighi*, although the heterozygote may sometimes be recognizable if one particular modifier is present.

(3) f. *natalica* is dominant to f. *hippocoonides* and recessive to f. *cenea* and f. *leighi* but produces an intermediate form with f. *trophonius*. This variety is known (Wells, *personal communication*) to occur occasionally in the wild but so far as is known is unnamed.

(4) f. *trophonius* is dominant to f. *hippocoonides* and f. *cenea*, but forms an intermediate with f. *natalica* and f. *leighi*.

(5) f. *leighi* is dominant to f. *hippocoonides*, f. *natalica* and nearly always to f. *cenea*, but it forms an intermediate (f. *salaami*) with f. *trophonius*. F. *salaami* is extremely rare in South Africa, as it must be on this hypothesis, f. *trophonius* seldom being more common than 10 per cent. and f. *leighi* more than 2 per cent. of the population.

Allelomorphism.—The data also show that f. *hippocoonides*, f. *leighi* and f. *trophonius* are controlled by multiple allelomorphs and that *cenea* also is almost certainly controlled by the same locus. The data on f. *natalica* are almost as complete and are also consistent with it being controlled by another allelomorph of this series. Because the genes are allelomorphs, f. *salaami* mated to an insect homozygous for *hippocoonides* produces nothing but f. *trophonius* and f. *leighi*, and we have had many families of this type.

Race crosses.—Through the great kindness of Mr. Taylor and Dr. van Someren stocks of subspecies *P. dardanus dardanus*, homozygous for f. *hippocoon*, were received from Ghana and Uganda respectively. These localities are near the edges of the Western and Eastern distribution of ssp. *dardanus*. The wealth of material sent by Dr. van Someren in the summer of 1957 has made possible a more detailed study of race crosses utilizing material from Uganda than from Ghana. The great increase in the number of families which were bred at this time led to a search for new food plants, and resulted in the discovery that *Choisya ternata* was better than the *Citrus* previously used.

The genetic analysis of these crosses showed that the difference between f. *hippocoonides* and f. *hippocoon*, mimicking *A. niavius dominicanus* and *A. niavius niavius* respectively, is controlled in quite a different way from the other forms described. Thus, the difference between these two patterns depends on a large number of genes, each having a small effect (multifactorial inheritance), and not on a single gene difference as is found between the other forms. Such a situation was predicted by Ford in 1953 and is contrary to the views expressed by Goldschmidt in 1945. His hypothesis of the origin of mimicry stated that the mimicry arises at one step by mutation and is not thereafter improved by the selection of modifiers. F. *hippocoon* and f. *hippocoonides* are different mimics but the difference between them could not have arisen at a single step as the data show that it involves many genes.

On crossing f. *cenea* from South Africa with f. *hippocoon* from Ghana where *cenea* does not occur, abnormal insects resulted which were somewhat intermediate between the two forms. In contrast to this, on crossing f. *cenea* with f. *hippocoon* from Uganda where f. *cenea* is found at a low frequency, a much less extreme deviation from the normal pattern occurred. This suggests strongly that genes which perfect the mimetic pattern in South Africa are not present in Ghana owing to the absence of the mimic and model and therefore the absence of the selection necessary for their accumulation. In Uganda, on the other hand, many of the modifiers are present as is shown by the small degree of breakdown. This hypothesis is greatly strengthened by the situation found with f. *trophonius*, for here the mimic is found in both areas and there is no breakdown of the mimetic pattern on crossing South African f. *trophonius* with f. *hippocoon* from either Ghana or Uganda.

It is intended to carry the matter further by investigating the primitive non-mimetic race from Madagascar.

We are very grateful to the Nuffield Foundation for its generous support without which much of the work could not have been carried out.

TEA will be served in the Library before the meeting.

NOTICES

Forthcoming Ordinary Meetings.

Preliminary notice is given below of the principal papers to be read at the next two Ordinary Meetings.

2nd April, 1958.

(1) **Miss D. J. Jackson.**—Egg-laying and egg-hatching in some species of *Agabus* (Coleoptera : Dytiscidae).

(2) **Dr. H. E. Hinton.**—Form and behaviour of the pigmented tissue of *Simulium*.

7th May, 1958.

(1) **Professor V. B. Wigglesworth.**—Recent work on the Juvenile Hormone.

(2) To be arranged.

PROCEEDINGS OF THE ANNUAL MEETING HELD ON 5TH FEBRUARY, 1958.

Professor O. W. RICHARDS, President, in the Chair.

Present, 71 Fellows and 16 Visitors.

Before the meeting formally opened, the President welcomed Dr. H. J. R. Dürr, from the University of Stellenbosch, South Africa, and Dr. and Mrs. Henry Townes from Ann Arbor, Michigan, U.S.A.

The Secretary read the names of the Officers and Council for 1958, and they were declared duly elected in accordance with the Bye-Laws.

The Secretary read the Report of the Council for 1957, which was adopted, subject to a minor amendment, on the proposal of Dr. W. J. Hall, seconded by Mr. N. D. Riley.

The Treasurer read his Annual Report and this, with the accounts for the year ending 31st December, 1957, was adopted on the motion of Mr. Arthur Welti, seconded by Mr. C. N. Hawkins.

The President then made his concluding remarks.

The formal meeting then closed and was followed by a film made in 1956 by an expedition to the Ivory Coast, led by Professor P.-P. Grassé. A commentary was given by Mr. W. V. Harris.

A vote of thanks to the Officers for their services throughout the year was proposed by Mr. C. N. Hawkins and carried unanimously.

PAUL FREEMAN, *Honorary Secretary.*

The next meeting will be held on 2nd April, 1958.

Additions to the Library.

Presented.

Basilewsky (P.). Contribution à l'étude de la faune entomologique du Ruanda-Urundi (Mission P. Basilewsky, 1953) Pt. IV. *Ann. Mus. Congo belge, Tervuren* 8vo (*Zool.*) **58** ; 1–323, 1957. [Musée R. Congo Belge, Tervuren.]

British Museum (Natural History) Economic Series. 4. *Mosquitoes and their relation to disease.* 6th ed. 8vo. London, 1958. [Pamphl.] [Trustees of the British Museum (Natural History)].

Carne, B. P., *Systematic revision of Australian Dynasticinae.* 8vo. Melbourne : C.S.I.R.O., 1957. [The Publishers].

Roth, L. M., and Willis, E. R. The medical and veterinary importance of cockroaches. *Smithson. misc. Coll.* **134** (10) : 1–147, 1957. [Smithsonian Institution.]

Purchased.

Blatchley, W. S., and Leng, C. W. *Rhynchophora or Weevils of North Eastern America.* 8vo. Indianapolis : Nature Publ. Co., 1916.

Esaki, T., and Itọ, S. *A tentative catalogue of Jassoidea of Japan, and her adjacent territories.* 8vo. Tokyo : Japan Society for the Promotion of Science, 1954.

Insects of Micronesia. 8vo. Họnolulu : Bishop Museum, 1954—
- Vol. 3 (1) *Pseudoscorpionida*, by M. Beier. 1957.
- Vol. 3 (2) *Scorpionida*, by E. A. Chapin—*Opiliones*, by C. J. and M. L. Goodnight. 1957.
- Vol. 4 (1) *Pauropoda*, par P. A. Remy. 1957.
- Vol. 7 (3) *Heteroptera : Aradidae*, by R. Matsuda and R. L. Usinger, 1957.

Lindner, E. *Die Fliegen der Palaearktischen Region.* 8vo. Stuttgart, 1924—
- Bd. III. Fam. 9, 9*a*, 9*b*. *Psychodidae* von H. F. Jung und O. Theodor, 1958.
- Bd. IV (4) Fam. 28. *Empididae* von E. O. Engel und R. Frey. 1938–56.
- Bd. VIII. Fam. 64*i*. *Calliphorinae* von F. Zumpt. 1956.

In addition, separates have been presented by Dr. P. T. Haskell ; the Commonwealth Institute of Entomology ; Dr. J. Risbec ; Dr. B. R. Laurence ; Mr. F. Isherwood ; United States Department of Agriculture ; Dr. D. K. McE. Kevan ; Dr. J. M. Whitten ; Dr. T. T. Macan ; Mr. H. M. Hallett and the Zoölogisch Laboratorium der Rijksuniversiteit, Leiden.

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